

Montana Department of Natural Resources and Conservation
Water Resources Division
Water Rights Bureau

ENVIRONMENTAL ASSESSMENT
For Routine Actions with Limited Environmental Impact

Part I. Proposed Action Description

1. Applicant/Contact name and address:

Louis D. Burrell, Margaret Carr, & Louis L. Burrell
227 Burrell Dr
Libby, MT 59923

2. Type of action: Groundwater Application for Beneficial Water Use Permit No. 76D 30122042

3. Water source name: Groundwater

4. Location affected by project: The place of use is generally located in the W2SE of Section 17, Township 31N, Range 31W, Lincoln County, Montana

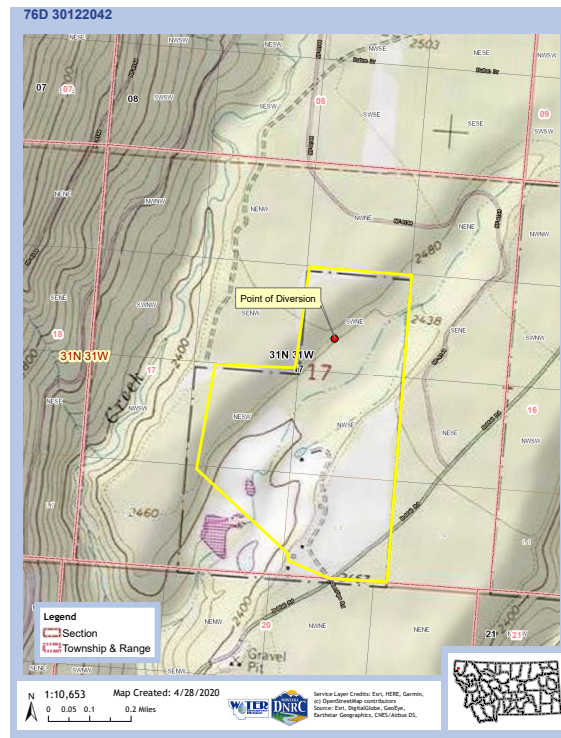


Figure 1: Map of place of use and proposed new point of diversion

5. **Narrative summary of the proposed project, purpose, action to be taken, and benefits:**

The Applicant proposes to divert 219 GPM up to 346.3 AF of groundwater via a developed spring January 1st thru December 31st for geothermal (33.9 AF) and power generation (313.0 AF) uses January 1st to December 31st. The DNRC shall issue a water use permit if an applicant proves the criteria in 85-2-311 MCA are met.

6. **Agencies consulted during preparation of the Environmental Assessment: (include agencies with overlapping jurisdiction)**

- U.S. Fish and Wildlife Service and Montana Natural Heritage Program: Endangered, Threatened Species and Species of Special Concern, Wetland Mapper program
- Montana Department of Fish Wildlife & Parks (DFWP); Dewatered Stream Information
- Montana Department of Environmental Quality's (MDEQ) Clean Water Act Information and PWS Drinking Water Watch databases
- U.S. Natural Resource Conservation Service (NRCS); web soil survey
- Montana Historical Society

Part II. Environmental Review

1. **Environmental Impact Checklist:**

<p style="text-align: center;">PHYSICAL ENVIRONMENT</p>
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WATER QUANTITY, QUALITY AND DISTRIBUTION

Water quantity - Assess whether the source of supply is identified as a chronically or periodically dewatered stream by DFWP. Assess whether the proposed use will worsen the already dewatered condition.

The Applicant is proposing to divert groundwater via a developed spring for geothermal and power generation use; they are both non-consumptive uses. All water that is diverted from the spring is returned to the watershed. The proposed application will not create new depletions to surface water or groundwater.

Determination: No impact.

Water quality - Assess whether the stream is listed as water quality impaired or threatened by DEQ, and whether the proposed project will affect water quality.

The Applicant is proposing to divert groundwater via a developed spring for geothermal and power generation use; they are non-consumptive uses. All water that is diverted from the spring is returned to the watershed. The Department found that the proposed use will not affect water quality.

Determination: No impact.

Groundwater - Assess if the proposed project impacts ground water quality or supply.
If this is a groundwater appropriation, assess if it could impact adjacent surface water flows.

The Applicant is proposing to divert groundwater via a developed spring for geothermal and power generation use; they are both non-consumptive uses. All water that is diverted from the spring is returned to the watershed. The proposed application will not create new depletions to surface water or groundwater

Determination: No impact.

DIVERSION WORKS - Assess whether the means of diversion, construction and operation of the appropriation works of the proposed project will impact any of the following: channel impacts, flow modifications, barriers, riparian areas, dams, well construction.

Water is diverted from the developed spring via a concrete spring box (12 feet long, eight feet wide and two feet tall) that utilizes six feet of ten-inch stainless-steel well screen to collect water into a four-inch PVC mainline. Using the gravitational flow form of the Hazen-Williams equation (pipe diameter of four inches, roughness coefficient of 150 for plastic pipe, drop of 37 feet and distance of 1,500 feet), the capacity of the four-inch line is 219 GPM. The mean monthly flow of the spring is 524 GPM. Water in excess of the capacity of the mainline leaves the spring box and enters two stream channels that flow southwesterly across the Applicant's property. Once in the mainline, water is conveyed 1,500 feet to the primary pumphouse and stored in a 2,000-gallon tank.

Six submersible pumps will divert water from the tank; five of the six pumps are associated with five open-loop geothermal heating and cooling systems. The remaining pump is authorized under Statement of Claim 76D 30126851, 76D 30126857 and 76D 30126861, and Groundwater Certificate 76D 30126862 and supplies water for multiple domestic, shop, lawn and garden irrigation and stock use. In combination the four associated water rights pump 35 GPM. The six pumps may at times operate in tandem, the storage tank provides the additional capacity needed to meet peak demand.

Each geothermal system consists of a one-horsepower Hallmark Industries MA0414X-7A RapidFlo submersible pump, Amtrol VW-44 pressure tank and either a water to air heat exchanger (Miami Heat Pump HPX048) or water to water geothermal exchanger (Miami Heat Pump model WW060). The rate at which water will be withdrawn from the tank by a submersible pump depends on the total dynamic head (TDH) of each system. Based on supplied pump specifications and TDH calculations to each dwelling, the pumping rate of each Hallmark pump will be either 12 GPM or 14 GPM. Three of the water to water heat exchangers require a total of 41 GPM (13.5 GPM per exchanger), while the other two water to air exchangers require an additional 24 GPM (12 GPM per exchanger). The combined peak demand for geothermal use is 65 GPM. The exchange pumps are controlled by the heating and cooling demands at their place of use. The geothermal water systems are distinct, with one of the five units serving the shop and the other four heat exchange units serving three residences, with residence number three utilizing two of the water to water geothermal exchangers. After flowing through each unit, water is discharged to the shallow groundwater in the location identified on Figure 2.

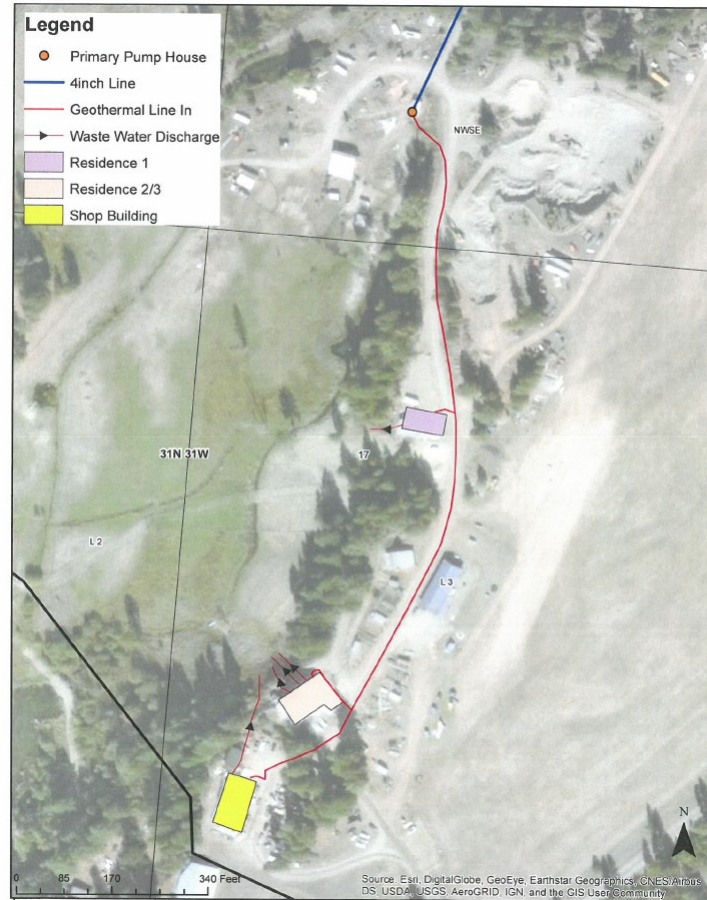


Figure 2: Layout of geothermal heating and cooling system

Overflow water from the 2,000-gallon storage tank will be captured by a four-inch water line and transported to a water wheel located alongside the natural East channel for power generation use. The water will pass over a ten-foot diameter overshot water wheel; the full volume of water in the pipe will be directed through a PVC pipe that protrudes over the wheel. Water will fall into buckets causing the wheel to turn. This action will impart energy to an electrical generator that will produce electricity and be stored in batteries. The flow over the water wheel will range from 119 GPM (219 GPM pipe capacity – 65 GPM geothermal use – 35 GPM multiple domestic/stock/shop/lawn garden use) during periods of peak water use to 219 GPM when water is not being diverted for other uses. The water wheel will produce an estimated 125 to 227 watts subject to the efficiency of the power generator system installed. Energy will be stored in batteries and/or utilize on demand.

Determination: No impact.

UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES

Endangered and threatened species - Assess whether the proposed project will impact any threatened or endangered fish, wildlife, plants or aquatic species or any “species of special concern,” or create a barrier to the migration or movement of fish or wildlife. For groundwater, assess whether the proposed project, including impacts on adjacent surface flows, would impact any threatened or endangered species or “species of special concern.”

The Montana Natural Heritage Program and DFWP websites were reviewed to determine if there are any threatened or endangered fish, wildlife, plants or aquatic species or any “species of special concern”, that could be impacted by the proposed project.

According to the Montana Natural Heritage Program in Township 31N, Range 31W there are three plant species of concern: Moonworts (*Botrychium*), Geyer’s Biscuitroot (*Lomatium geyeri*) and Columbia Onion (*Allium columbianum*). Agriculture and human development have existed for over 30 years around this location, impact to sensitive plant species has most likely already occurred.

There are 23 animal species of concern. The Bull Trout (*Salvelinus confluentus*) is threatened. The Townsend’s Big-eared Bat (*Corynorhinus townsendii*), Fisher (*Pekania pennanti*), Wolverine (*Gulo gulo*), Black-backed woodpecker (*Picoides arcticus*), Harlequin Duck (*Histrionicus histrionicus*), Western Toad (*Anaxyrus boreas*), Coeur d’Alene Salamander (*Plethodon idahoensis*), Columbia River Redband Trout (*Oncorhynchus mykiss gairdneri*), and Westslope Cuthroat Trout (*Oncorhynchus clarkii lewisi*) are listed as sensitive by the USFS.

The following are species of concern for the state of Montana: Hoary Bat (*Lasiurus cinereus*), Little Brown Myotis (*Myotis lucifugus*), Pileated Woodpecker (*Dryocopus pileatus*), Northern Goshawk (*Accipiter gentilis*), Great Blue Heron (*Ardea herodias*), Evening Grosbeak (*Coccothraustes vespertinus*), Clark’s Nutcracker (*Nucifraga columbiana*), Cassin’s Finch (*Haemorhous cassinii*), Western Skink (*Plestiodon skiltonianus*), and Torrent Sculpin (*Cottus rhotheus*). An adequate quantity of water will still exist in surface water sources to maintain existing populations of aquatic species should they exist there currently. Agriculture and human development have existed on this section of land for over 30 years; any impacts to sensitive mammal species most likely has already occurred. No impact.

Determination: No significant impact.

Wetlands - *Consult and assess whether the apparent wetland is a functional wetland (according to COE definitions), and whether the wetland resource would be impacted.*

Determination: N/A, project does not involve wetlands or critical riparian habitats

Ponds - *For ponds, consult and assess whether existing wildlife, waterfowl, or fisheries resources would be impacted.*

Determination: N/A, project does not involve ponds.

GEOLOGY/SOIL QUALITY, STABILITY AND MOISTURE - *Assess whether there will be degradation of soil quality, alteration of soil stability, or moisture content. Assess whether the soils are heavy in salts that could cause saline seep.*

According to soil survey data provided by the NRCS, soil within the place of use consists mostly of lacustrine deposits made up of silt loam and very fine sandy loam. The soils are not susceptible to saline seep. Use of groundwater will not cause degradation of soil quality and stability.

Determination: No impact.

VEGETATION COVER, QUANTITY AND QUALITY/NOXIOUS WEEDS - *Assess impacts to existing vegetative cover. Assess whether the proposed project would result in the establishment or spread of noxious weeds.*

Any impacts to existing vegetation will be within the range of current disturbances due to current development.

Determination: No impact.

AIR QUALITY - *Assess whether there will be a deterioration of air quality or adverse effects on vegetation due to increased air pollutants.*

Adverse air quality impacts from increased air pollutants are not expected as a result of this project. No air pollutants were identified as resulting from the applicants proposed use of groundwater.

Determination: No impact.

HISTORICAL AND ARCHEOLOGICAL SITES - *Assess whether there will be degradation of unique archeological or historical sites in the vicinity of the proposed project if it is on State or Federal Lands. If it is not on State or Federal Lands simply state NA-project not located on State or Federal Lands.*

Determination: N/A, project is not located on state or federal land.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AND ENERGY - *Assess any other impacts on environmental resources of land, water and energy not already addressed.*

All impacts to land, water and energy have been identified and no further impacts are anticipated.

Determination: No impact.

HUMAN ENVIRONMENT

LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS - *Assess whether the proposed project is inconsistent with any locally adopted environmental plans and goals.*

The project is located in an area with no locally adopted environmental plans.

Determination: No impact.

ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES - *Assess whether the proposed project will impact access to or the quality of recreational and wilderness activities.*

The proposed project will not inhibit, alter or impair access to present recreational opportunities in the area. The project is not expected to create any significant pollution, noise, or traffic congestion in the area that may alter the quality of recreational opportunities. The proposed place of use and diversion do not exist on land designated as wilderness.

Determination: No impact.

HUMAN HEALTH - *Assess whether the proposed project impacts on human health.*

There should be no significant negative impact on human health from this proposed use.

Determination: No impact.

PRIVATE PROPERTY - *Assess whether there are any government regulatory impacts on private property rights.*

Yes___ No x *If yes, analyze any alternatives considered that could reduce, minimize, or eliminate the regulation of private property rights.*

Determination: No impact.

OTHER HUMAN ENVIRONMENTAL ISSUES - *For routine actions of limited environmental impact, the following may be addressed in a checklist fashion.*

Impacts on:

- (a) Cultural uniqueness and diversity? None identified.
- (b) Local and state tax base and tax revenues? None identified.
- (c) Existing land uses? None identified.
- (d) Quantity and distribution of employment? None identified.
- (e) Distribution and density of population and housing? None identified.
- (f) Demands for government services? None identified.
- (g) Industrial and commercial activity? None identified.
- (h) Utilities? None identified.
- (i) Transportation? None identified.
- (j) Safety? None identified.
- (k) Other appropriate social and economic circumstances? None identified.

2. ***Secondary and cumulative impacts on the physical environment and human population:***

Secondary Impacts: None identified.

Cumulative Impacts: None identified.

3. ***Describe any mitigation/stipulation measures:*** None identified.
4. ***Description and analysis of reasonable alternatives to the proposed action, including the no action alternative, if an alternative is reasonably available and prudent to consider:*** No reasonable alternatives were identified in the EA.

PART III. Conclusion

1. ***Preferred Alternative:*** None identified.
2. ***Comments and Responses:*** None.
3. ***Finding:***
Yes___ No_x__ Based on the significance criteria evaluated in this EA, is an EIS required?

If an EIS is not required, explain why the EA is the appropriate level of analysis for this proposed action:

An EA is the appropriate level of analysis for the proposed action because no significant impacts were identified.

Name of person(s) responsible for preparation of EA:

Name: Melissa Brickl

Title: Hydrologist/Water Resource Specialist

Date: May 14, 2020